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Comparison of transurethral resection and transperineal needle biopsy in the diagnosis of occult prostatic carcinoma

Dick R. Smith
University of Nebraska Medical Center

A COMPARISON OF TRANSURETHRAL RESECTION AND TRANSPERINEAL NEEDLE BIOPSY IN THE DIAGNOSIS OF OCCULT PROSTATIC CARCINOMA.

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Dick R. Smith

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Introduction

This paper is a pilot study to determine the relative accuracy of specimens obtained by needle biopsy and transurethral resection in the diagnosis of occult prostatic carcinoma and to evaluate the possibility of routine needle biopsy prior to transurethral resection as a means of discovering occult carcinoma. An occult carcinoma is one which is clinically unsuspected. There have been conflicting reports in the literature as to whether specimens obtained by one or the other methods is more reliable in obtaining tissue for the histologic diagnosis of prostatic malignancy. Data will be presented to evaluate the relative merits of these methods in the diagnosis of occult carcinoma.

Method

The charts and pathologic specimens of forty-three patients at the Omaha Veterans Administration Hospital who had transperineal needle biopsies and transurethral resections of the prostate were reviewed. Thirty-four of these patients underwent transurethral resection for what was thought preoperatively to be benign prostatic hyperplasia with bladder outlet obstruction. In none of these patients was there elevation of the serum acid phosphatase or evidence of bone metastases. In the other nine patients there was clinical suspicion

of carcinoma prior to operation.

The biopsies in all cases were performed using a Franklin modification of the Vim-Silverman needle. A Lowsley retractor was utilized to maintain the prostate in the proper position for biopsy. (See Figure 1.) A total of four specimens, two from each postero-lateral area, were obtained in each case. When carcinoma was suspected, an attempt was made to biopsy the suspicious area. All biopsies were obtained just prior to trans-urethral resection.

Following operation the prostatic fragments and biopsy specimens were submitted for pathologic examination. After weighing, the fragments were examined grossly by the pathologist and approximately 20 per cent of the total specimen submitted was sectioned and stained in the routine manner and examined microscopically. In cases where a strong clinical suspicion of carcinoma was present, additional fragments were examined if the initial slides did not reveal the suspected diagnosis. The needle biopsy specimens were also examined microscopically after longitudinal sectioning and staining. Biopsies were reported as carcinoma, benign prostatic hyperplasia, normal, or unsatisfactory for diagnosis. All slides were examined by two staff pathologists. It is to be emphasized that all pathologic examinations were made in the routine manner. No special efforts to ex-

amine the specimens were utilized.

The diagnoses obtained from the needle biopsy specimens and from the prostatic fragments were tabulated and evaluated with respect to each other. They were also correlated with clinical suspicion of carcinoma.

Results (See Table 1.)

Of the 43 patients, ten (24.3 per cent) were found to have carcinoma on histopathologic review of the biopsy specimens, fragments obtained by transurethral resection, or both. Of 34 patients in whom there was no clinical evidence of carcinoma, five, or 14.7 per cent, were found to have carcinoma. Examination of fragments obtained by transurethral resection was positive for carcinoma in all five cases; examination of the needle biopsy specimens was positive in only one.

In the clinically suspicious group of nine patients, five were found to have carcinoma. Four of these were diagnosed by examination of specimens obtained by both transurethral resection and needle biopsy. In a single instance the needle biopsy specimen alone was diagnostic for carcinoma.

The relative accuracy of obtaining fragments diagnostic of carcinoma by needle biopsy as compared to transurethral resection was found to be 20 per cent in

the clinically benign group and 100 per cent in the clinically suspicious group.

In correlating findings of rectal examination with histologic diagnoses, there were found to be four patients suspected of having carcinoma who did not.

Two of 43 biopsies, or 4.6 per cent, contained insufficient tissue for diagnosis.

Discussion

Numerous autopsy studies have determined the incidence and location of prostatic carcinoma. The most frequently used technique has been that of step-section --that is, examining specimens at stipulated intervals throughout the entire gland, although examinations of single and random sections have been used by some investigators. A review of this literature by Purser and associates[1] revealed that 85 to 95 per cent of prostatic carcinomas originate in the capsular or subcapsular portions of the posterior or lateral lobes. Posterior lobe involvement was found to be more common by most investigators[2,3,4].

The high incidence of posterior lobe involvement suggests that needle biopsy -- approaching as it does from the posterior aspect of the gland -- would be a valuable technique for obtaining diagnostic tissue.

Many investigators have reported on the use of the

needle biopsy in diagnosing carcinoma in the clinically suspicious gland. An excellent review of these is made by Sika and Lundquist[5]. Their tabulations reveal a wide spectrum of diagnostic accuracy, ranging from 19 to 100 per cent. They remark that the variations in series size, methods of selection of patients for study, patient population of the institute reporting, technical details of the biopsies, and other factors make valid comparisons difficult.

Kaufman and Schultz[6] in the largest reported series to date, 704 biopsies on 656 patients, found an overall accuracy of 76 per cent when compared to the findings of open perineal biopsy. They classified their cases into four groups depending on the clinical extent of disease. Positive needle biopsies ranged from 67 per cent when a single nodule within the substance of the gland was present, to 86 per cent when there was evidence of metastases. These values are generally in agreement with several other studies[5,7], and demonstrate the finding that needle biopsy accuracy increases as the gland becomes more extensively involved with carcinoma.

In contrast to needle biopsy, there has been little written about the diagnosis of prostatic carcinoma by transurethral resection. Holtgrewe and Valk[8], reporting on a series of 2,015 transurethral resections, found fifteen per cent to contain carcinoma. Denton et. al.[9],

studying 85 patients who underwent transurethral resection for prostatic hypertrophy in whom there was no suspicion of carcinoma prior to resection, reported an incidence of six per cent by routine examination of the prostatic fragments and an additional fifteen per cent when step-sections of the fragments were examined, for a total of 21 per cent occult carcinoma. This total compares favorably with a 24 per cent incidence of occult carcinoma reported in a review of autopsy series by Emmett[10].

Purser and associates[1] compared the diagnostic yield of fragment examination obtained by needle biopsy and transurethral resection in 308 patients with known carcinoma of the prostate. They divided their cases into two groups. Group One included those with unequivocably advanced disease as determined clinically or histologically. Two hundred patients fell into this group and 195 of these had positive fragments from both transurethral resection and needle biopsy. Group Two consisted of lesions limited to one or two foci or less than 25 per cent involvement of the examined tissue. In this group, composed of 108 cases, they obtained specimens diagnostic of carcinoma by needle biopsy in 96, by transurethral resection in 70, and by both methods in 50 cases. They concluded that needle biopsy is superior to transurethral resection in diagnosing pros-

tatic carcinoma in less advanced cases.

Denton and associates[11] analyzed 300 cases of transurethral prostatectomy in which preliminary needle biopsies using the Vim-Silverman needle were done. They classified patients into obvious carcinomas, suspicious, and benign groups. In the obvious carcinoma group of thirteen patients they found the resection specimen and needle biopsy to agree in all cases. In the clinically benign group of 239 patients, fifteen carcinomas were diagnosed by transurethral resection fragments. Only six of these were also diagnosed by needle biopsy. They found no cases in which a needle biopsy specimen alone was positive for carcinoma. In the suspicious group of 48 cases, 25 were found to have carcinoma by examination of the transurethral resection fragments and 16 by examination of the needle biopsy specimens. They found that needle biopsy had an overall relative accuracy of 64 per cent compared to transurethral resection and a 76 per cent relative accuracy if only the cases with carcinoma were considered. These authors conclude that needle biopsy is less accurate in diagnosing carcinoma than transurethral resection regardless of the extent of the carcinoma. Their results are similar to those of Sika and Lundquist[5] who found that needle biopsy gave 25 per cent false negative results when compared with subsequent material obtained at autopsy,

supra- or retropubic prostatectomy or transurethral resection. The findings reported here tend to support those of Denton and associates cited above.

Dussot[12] has suggested that occult prostatic carcinoma has its origin in the peri-urethral glands. If true, this would explain the ineffectiveness of transperineal needle biopsy in the diagnosis of occult carcinoma.

The 4.5 per cent (2 of 45) incidence of unsatisfactory needle biopsies reported in this series is comparable to that of other studies. Kaufman and Schultz[6] reported an incidence of 8.8 per cent and Denton and associates[11] had unsatisfactory biopsies in 20 of 300 or 6.7 per cent. Arduino and Murphy[13] obtained tissue adequate for histologic diagnosis in over 99 per cent using the Franseen needle with a transperineal approach. The amount of tissue obtained with this needle is much greater than that obtained with the Vim-Silverman needle, however.

Summary

A study was made of 43 cases in which transperineal needle biopsy was performed prior to transurethral resection. In occult carcinoma only one of five cases was diagnosed by examination of material obtained by needle biopsy as compared to that obtained by trans-

urethral resection. When carcinoma was suspected, all that were diagnosed by examination of the fragments obtained by transurethral resection were also diagnosed by examination of the specimens obtained by needle biopsy.

The value of routine needle biopsy of all prostatic adenomas prior to transurethral resection in an attempt to find occult carcinomas appears questionable, but the final answer awaits further study.

Figure 1

Transperineal Needle Biopsy of the Prostate

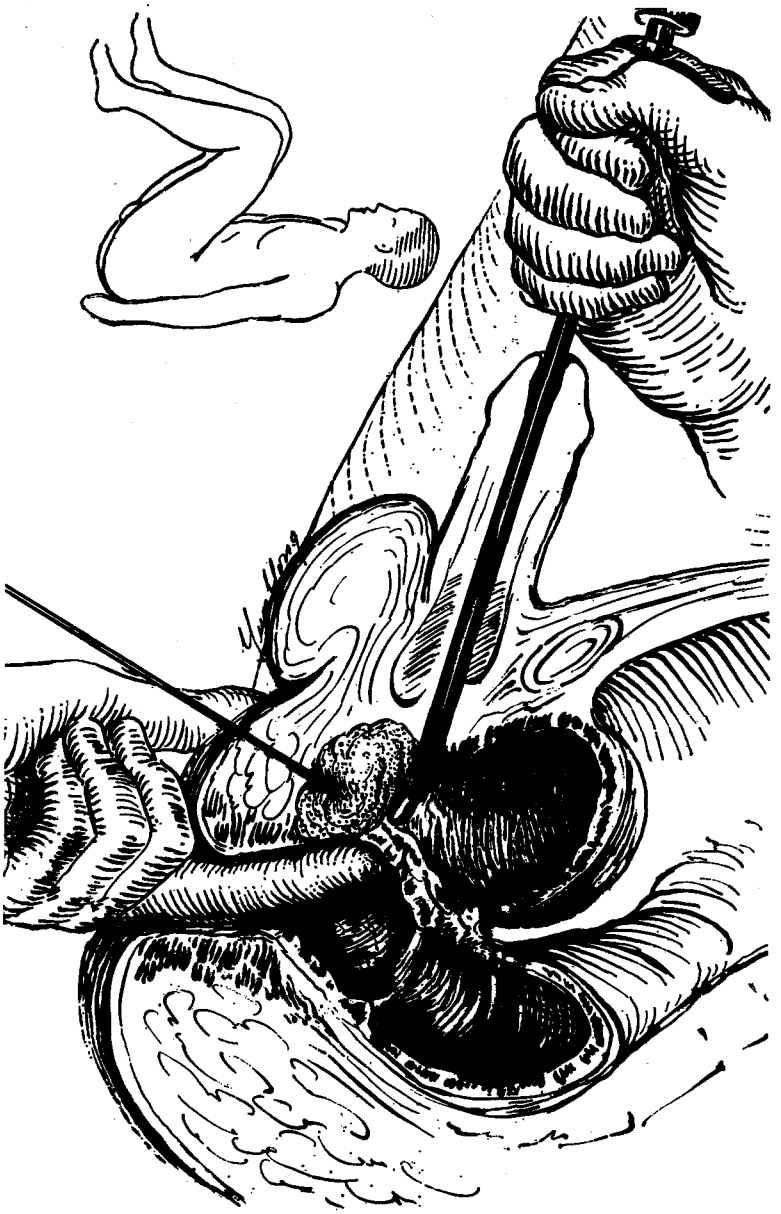

Table 1

Comparison of Transurethral Resection and Needle Biopsy in the Diagnosis of Prostatic Carcinoma

	Clinically benign (total 34)		Clinically suspicious (total 9)	
	Carcinoma present	Carcinoma absent	Carcinoma present	Carcinoma absent
TUR	5	29	4	5
Needle biopsy (NB)	1	33	5*	4
Relative accuracy NB to TUR	20%		100%	

*This figure includes the single case of carcinoma identified by examination of the needle biopsy alone.

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